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AUTHOR	Cooper, J. David
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ABSTRACT

A sample of 15 good and 15 poor first-grade readers, selected on the basis of the teacher's classification, performance on the Gates-MacGinitie Reading Test, Primary A, Form 1, and the Peabody Picture Vocabulary Test, was individually taught five nonsense syllables by each of four teaching modality procedures: visual, auditory, kinesthetic, and a combination of the three. The teaching procedure was based on the Mills Learning Methods Test and was carried out by the researcher in a laboratory situation. Twenty-four hours later, a test of retention was given. As expected, good readers took significantly fewer trials to master nonsense syllables and retained more nonsense syllables than the poor readers did. However, no single mode of learning resulted in significantly superior acquisition or retention of nonsense syllables for either good or poor readers as a group. Rather, modality preference appeared to be an individual matter. Limitations and educational implications of the study are given, and tables and references are included. (CL)

Dr. J. David Cooper
212 Teachers College
Ball State University
. ncie, Indiana

A STUDY OF THE LEARNING MODALITIES OF GOOD AND POOR FIRST GRADE READERS

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PURPOSE OF THE STUDY

The purpose of this investigation was to study the differences in the learning modalities of good and poor first grade readers. More specifically, answers were sought to the following questions:

1. Are there differences in the learning modalities of good and poor first grade readers?

2. Across all modalities, do good readers and poor readers learn nonsense syllables equally well?

3. Across readers, do first graders learn nonsense syllables equally well by all modalities?

4. For good readers and poor readers is there a modality for learning nonsense syllables that is significantly superior to other modalities?

BACKGROUND AND SIGNIFICANCE

Much of the research in reading during the last decade has been devoted to studies which have sought to compare one teaching method with another; many of these studies were conducted to find the best method for teaching reading. However, the results of these studies can be clearly summarized by Chall's (4) statement in her discussion of research on beginning reading:

> One of the most important things, if not the most important thing, . . . learned from studying the existing research on beginning reading is that it says nothing consistently.

Further study of major research that has been completed since Chall's review supports the position that no one

method of teaching beginning reading is good enough to be used to the exclusion of another. (2) As Durkin (11) has stated, ". . . we have advanced to the realization that there is no single method of teaching beginning reading that is best for all children."

Therefore, reading specialists and researchers must begin to look in new directions for ways of improving reading instruction rather than looking for the best method. As Gates (6) has indicated, reading researchers need to abandon the idea that what is better on the average is superior for all; the learner must be seen as an individual.

There is a definite need to begin to match a particular teaching method with the learning style of a child. Selecting a teaching method that utilizes a child's modality strength is a procedure used in treating retarded readers in some reading clinics. (7) This same procedure might be used in beginning reading instruction to determine an appropriate method for each child.

Hills (11) has developed an instrument that is designed ". . . to aid the remedial reading teacher in determining the student's ability to learn new words under different teaching procedures." This instrument, in essence, is used to determine whether a child learns best by the Visual Modality, the Phonic or Auditory Modality, the Kinesthetic Modality,

or a combination of these modalities. The instrument or the procedure spelled out in the instrument has been used in a few research studies which dealt with older boys and girls or mentally retarded children. (10),(3),(1),(8) None of these studies has attempted to look at the modality strengths and weaknesses of beginning readers.

This investigation was designed to study whether learning modality strengths and weaknesses are readily discernible in beginning readers. It was reasoned that information might be obtained that would lead to new procedures of grouping in the early stages of reading instruction. De Hirsch (5) believes that modality strength and weakness is of more than a theoretical interest and should largely determine teaching method. Since few studies have explored the problem, a definite need for empirical evidence does exist.

DEFINITION OF TERMS

The following terms are used throughout this study as they are defined below:

Auditory Modality: a process of learning that utilizes primarily the sense of hearing.

Combination Modality: a process of learning that utilizes the senses of hearing, sight, and touch.

Kinesthetic Modality: a process of learning that emphasizes the sense of touch.

Visual Modality: a process of learning that utilizes primarily the sense of sight.

Learning Task: the acquisition of five nonsense syllables taught by a specified modality procedure.

Mastery: one correct response on all five nonsense syllables of the learning task.

PROCEDURES

Original Sample The original sample for the study was drawn from two elementary schools in Louisville, Kentucky which had been classified by school officials as middle class schools. There were eight first grade classrooms in the two schools.

Selection of Classrooms Since the type of reading program to which each subject had been exposed could affect his modality preference, an attempt was made to assess the classrooms involved on this variable. Each teacher was asked to complete a questionnaire concerning the type of instruction that she normally used in teaching reading. The completed questionnaire was used as the basis for an interview.

From these two sources it was concluded that the instruction given in the eight classrooms had been very similar. Therefore, no classroom was eliminated from the study.

Selection of the Final Sample Selection of good and poor readers was based on two criteria, teacher classification of pupils' reading performance in class, and student performance on the Gates MacGinitie Reading Test, Primary A, Form 1.

Each teacher was asked to divide her class into three groups according to pupil reading performance in class. This classification was done prior to testing to insure that the teacher's judgment was not affected by the test results. All teacher ratings were on an absolute scale and were not in relation to the pupil's ability. Groups I and III were designated good readers and poor readers respectively.

The second variable used for sample selection was the scores on the Gates MacGinitie Reading Test. The two subtest raw scores were averaged together for a total reading raw score. The scores were then listed in order from high to low for the total sample. The upper thirty percent was classified as good readers and the lower thirty percent as poor readers. These cut-off points have been used in previous research studies (9).

To be classified in the final sample as a good or a poor

reader each subject had to be classified as a good or a poor reader on both of the above variables.

The sample of good and poor readers was screened on intelligence using the Peabody Picture Vocabulary Test (PPVT). Any subject falling beyond one standard deviation below the mean was eliminated. The mean for the PPVT is 100 and the standard deviation is 15.

One hundred ninety-eight first graders were tested for selection of the final sample. Seven of the subjects were eliminated because they were repeaters; three were eliminated on the basis of being classified according to school officials as perceptually handicapped; two were eliminated because they were new to the school and it was not possible to determine the type of instruction to which they had been exposed prior to the time of the study. A total of 186 first graders met the criteria necessary for inclusion in the pool of subjects from which the final sample was selected.

Thirty subjects were classified as poor readers and thirty-one were classified as good readers according to the criteria set forth by this study. All of the sixty-one subjects were given the PPVT. Only one was eliminated on the basis of intelligence. This was a poor reader.

The twenty-nine poor readers and thirty-one good readers were listed in random order. The first fifteen in each group

were used as the subjects for the study.

Procedure for Studying Modalities The procedure used for exploring learning modalities was based on the Mills Learning Methods Test. This instrument served as an instructional model with some revision. The major changes which were made involved (1) a change from the use of real words to the use of nonsense syllables and (2) more explicit teaching procedures. Nonsense syllables were used to insure that all subjects could be presented the same stimuli in each teaching modality. The changed teaching procedures took the form of a separate script to be followed in each modality presentation.

Selection of Nonsense Syllables Nonsense syllables were selected from the combined Glaze and Krueger (13) list. This list indicates the association value of the syllables as determined by two studies. Only those syllables that had a 70 percent association value or higher on both studies were used. These syllables were then rated according to pronounceability as determined by a panel of eleven graduate students and faculty at Indiana University. Those syllables rated as easy to pronounce but not resembling real words by a majority of the raters were used for the final selection of

nonsense syllables. For each modality five of the syllables were randomly selected for the learning task and one syllable was used as a practice trial prior to the learning task. (See Table 1.) Consistent pronunciation of each syllable was maintained by the use of one examiner.

Teaching Modalities Four teaching modalities were utilized; a Visual Modality, an Auditory Modality, a Kinesthetic Modality, and a Combination Modality. Each modality was designed to emphasize primarily one of the senses of sight, sound, touch, or a combination of these.

The Visual Modality utilized the aspects of word length and configuration for teaching. Each subject compared the length of the syllables and matched each syllable with its correct configuration.

The Auditory Modality used the aspects of sounds and rhyming words in teaching. The sound elements of the syllables were isolated and blended together and a rhyming word was identified.

The Kinesthetic Modality involved tracing and copying each syllable.

The Combination Modality utilized the aspects of sight, sound and tracing in teaching. The Kinesthetic Modality syllables and the Combination Modality syllables were made of

TABLE 1. NONSENSE SYLLABLES SELECTED FOR EACH MODALITY

Visual	Auditory	Kinesthetic	Combination
wof*	dob*	kep	jen
wul	sek	pom	pek
sav	mal	lof	bux
mov	cag	gir	lon
tal	mul	jol	fes*
wif	kav	dat*	boc

*Indicates trial syllable

black sandpaper. All other syllables were printed in black India ink.

Each subject was individually taught five nonsense syllables by each of the four modality procedures. The order of modality presentation was randomized. The subjects were taught the syllables until they (1) mastered the task by correctly naming all five nonsense syllables as they were presented on the testing cycle, (2) completed ten trials of the teaching cycle followed by ten testing cycles, or (3) were given thirty minutes of instruction. The thirty minutes were counted as ten trials. Twenty-four hours later a test for retention was given. In order to control the teacher variable, this researcher instructed all subjects.

The data used for analysis were the number of trials to master the learning task (Acquisition Score) and the number of words retained over twenty-four hours (Retention Score).

To be included in the findings each subject had to be present for five consecutive days. Four subjects were lost due to absence and four were lost due to non-participation. Instruction of the subjects continued until there were 15 good readers and 15 poor readers.

DESIGN AND ANALYSIS

The design employed with this study was a modified repeated measures design. When the mean I.Q. scores of the good and poor readers were compared using the t-test, it was found that they differed significantly (See Table 2). Therefore, analysis of covariance was used with intelligence serving as the covariate. Where significance was achieved at the .05 level of confidence, the Scheffé post-hoc test was used for specific comparisons.

TABLE 2. RESULTS OF THE T-TEST COMPARING THE MEAN I.Q. OF GOOD AND POOR READERS

Type of Reader	Mean PPVT I.Q.
Good	111.6
Poor	103.5
t = 2.07 (df = 28)	significant at .05 level

SUMMARY OF MAJOR RESULTS

Three of the six major comparisons using analysis of covariance were significant at the .05 level of confidence. The data for these comparisons are summarized in Tables 3 and 4. Space does not permit a complete presentation of the data for the specific comparisons test. On the basis of the analysis of covariance and the Scheffé post-hoc test for specific comparisons, the following results were obtained:

1. Good readers as a group took significantly fewer trials than poor readers as a group to master the nonsense syllables in all modalities except the Visual Modality. The difference in the Visual Modality was not significant.

2. For good readers as a group and poor readers as a group, there was no modality significantly superior for the acquisition of nonsense syllables.

3. Good readers as a group retained significantly more nonsense syllables than the poor readers as a group when they were taught by the Kinesthetic Modality and the Combination Modality.

4. Within good readers as a group and within poor readers as a group, there was no modality significantly superior for ertention of nonsense syllables.

5. No single modality pattern characterized the good readers as a group or the poor readers as a group. In other

TABLE 3. SUMMARY OF ANALYSIS OF COVARIANCE FOR ACQUISITION SCORES

Source	SS	df	M.S.	F
(Good and Poor Readers Across Modalities)				
Readers	604.07	1	604.07	81.62**
Error	35.81	28	1.2788	
(Modalities With Good and Poor Readers Combined)				
Modalities	8.50	3	2.33	0.49
Error	483.21	83		
(Modality by Reader Interaction)				
Modality x Reader	49.68	3	16.56	2.84*
Error	483.21	83	5.82	

* significant at .05 level
** significant at .01 level

TABLE 4. SUMMARY OF ANALYSIS OF COVARIANCE FOR RETENTION SCORES

Source	SS	df	M.S.	F
(Good and Poor Readers Across Modalities)				
Readers	100.69	1	100.69	64.32**
Error	35.81	28	1.2788	
(Modalities With Good and Poor Readers Combined)				
Modalities	0.4941	3	0.1647	0.1029
Error	132.87	83	1.6008	
(Modality by Reader Interaction)				
Modality x Reader	7.5830	3	2.5277	1.579
Error	132.87	83	1.6008	

** significant at .01 level

words, when the learning profiles of each individual were examined, no consistent pattern was found within either group.

6. Variation in acquisition and retention scores between modalities was greater for poor readers than for good readers.

LIMITATIONS

This study was conducted under highly controlled conditions which entailed a one-to-one teaching situation isolated from the classroom; therefore, since many of the extraneous variables which operate in the classroom were controlled, the generalizability of the findings will be limited to such learning conditions.

The population sampled was specialized in that it included only first year first graders of average and above average intelligence; these subjects were drawn from middle and upper middle class schools as determined by school officials of a large city school system.

Other factors which limit the generalizability of the findings include the small sample size, the definition of mastery and the use of nonsense syllables instead of real words.

CONCLUSIONS

Based on the findings of this investigation and subject to the limitations cited above, the following conclusions seem warrented:

1. Modality preference in good and poor first grade readers appears to be an individual matter. No single mode of learning was superior for acquisition or retention for either good or poor readers.

2. Modality preference appeared to be more important for poor readers than for good readers. However, in some cases the acquisition and retention of the good readers appeared to be affected by the mode of presentation.

3. Although the results were not statistically significant, there was a trend in the data which indicated that poor readers as a group do not learn best by the Kinesthetic Modality and that good readers as a group do learn best by this modality.

4. Good readers as a group tend to learn nonsense syllables with fewer trials than do poor readers.

5. The learning task used in this investigation appears to be one that could be employed for identifying learning modality strengths and weaknesses. More exploration will be needed before the technique can be refined and used in actual classroom practice. For example, the predictive validity of

the procedure must be determined.

EDUCATIONAL IMPLICATIONS

Since this was a basic research investigation, generalizability of the findings to classroom practice is limited until further research can be conducted.

Modality preference was an individual matter. No one mode of learning was significantly superior for good readers or poor readers as a group. Therefore, future attempts to study learning modalities should attend to the learning of individuals and not be so concerned with groups.

A significant implication is that modality preference appears to be important enough to make a difference in how well individuals learn and retain words. For example, inspection of the individual profiles for poor readers shows that many of the subjects in this group learned and retained more syllables by one mode than by another. Although many of these differences are not statistically significant, it is likely that they are educationally significant for the individuals concerned. Even though mode of presentation appeared to be more important for poor readers, it also seemed to make enough difference to merit consideration for good readers.

Since the data seemed to indicate that poor readers do not learn words best by the Kinesthetic Modality, caution should be exercised in using this type of teaching procedure with all poor readers until further investigations can be conducted.

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